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vol. i. p. 2), two suppositions relative to the value of the refractive index presented themselves. Putting M for the *modulus*, and χ for the *characteristic*, I had to choose between the values $M\cos\chi$ and $\frac{M}{\cos\chi}$. The latter value is that which I adopted; the former, which is M. Cauchy's, was rejected because I saw that it would lead to the result above mentioned.

Another result of M. Cauchy's, which he has given twice in the *Comptes Rendus* (tom. ii. p. 428, and tom. viii. p. 965) requires to be noticed. When a polarized ray is reflected by a metal, the phase of its vibration is altered, and if the incidence be oblique, the change of phase is different, according as the light is polarized in the plane of incidence, or in the perpendicular plane. But when the ray is reflected at a perpendicular incidence, it is manifest that the change is a constant quantity, whatever be the plane of polarization. In fact, the distinction between the plane of incidence and the perpendicular plane no longer exists, and the phenomena must be the same in all planes passing through the ray. Yet M. Cauchy, in the two places above quoted, asserts it to be a consequence of his theory, that in this case the alterations of phase are different for two planes of polarization at right angles to each other, and that the difference of the alterations amounts to half an undulation. The same singular hypothesis had been previously made by M. Neumann (*Poggendorff's Annals*, vol. xxvi. p. 90), whom M. Cauchy appears to have followed; but M. Neumann has since admitted it to be erroneous (*Ibid.* vol. xl. p. 513).

Mr. J. Huband Smith communicated to the Academy some particulars connected with the recent discovery of a cairn containing cinerary urns, which appears to have been accompanied by some circumstances not unworthy of notice.

It took place at Loughanmore, in the county of Antrim, the seat of Mr. Thomas Adair, in a field which was being ploughed, in the spring of 1840. After a few urns had been found, there being some difficulty in preserving them entire, Mr. Adair, with a commendable desire to avoid the destruction of remains so full of interest, caused the cairn, in which these urns were found, to be closed carefully, and restored the ground to its former state as nearly as might be, in order to leave it to some skilful and experienced antiquary to explore the entire in a more deliberate and scientific manner.

The discovery was occasioned by one of the horses which were in the plough suddenly stumbling, one of his legs having sunk nearly up to the knee in a deep hole. On examination it was found he had put his foot into a fine sepulchral urn, which, it need hardly be stated, was broken into shivers.

On a slight further search a second urn was discovered. Every effort was made to preserve this one entire, but in vain; it fell to pieces in the hands of the person who took it up. A third urn was then exposed, when Mr. Adair finding it impossible to save them, put a stop for the time to the further opening of the cairn.

The cairn in which these urns were found is situated in the townland of Loughanmore, and not far from the *Loughan* or lake (now drained) from which the townland derives its name. It lies within a field called the cove-park, there being one or more artificial caves, or coves (as they are termed by the Antrim peasantry), within it. And from a hollow sound which the ground gives, other caves, as yet unopened, are confidently supposed to exist near where the urns were found.

The cairn in question is indicated by so very slight an elevation of the surface, that it was in course of being ploughed over without any *particular* notice, till the finding of the urns drew Mr. Adair's attention to it. This elevation was then observed to have a circumference of some twelve or fourteen feet, perhaps a little more; and on closer examination proved to be composed of loose field-stones mixed with earth, apparently laid in, upon, and around the urns, with just so much care as not to break them.

It will not fail to be noticed, that in this latter circumstance this cairn seems to differ remarkably from most others, for instance Deveril Barrow in Dorsetshire, which has been thought worthy of an elegant descriptive work, and many other of the Wiltshire Barrows, so carefully and scientifically opened by an eminent and accomplished English antiquary, the late Sir Richard Colt Hoare; and also from the very important cairn opened at Mount Stewart, near Grey-Abbey, in the county of Down, about the year 1807. In these the urns have almost invariably been protected by a kist or stone chest formed of flags, enclosing a considerable space. We have the authority of our distinguished Irish antiquary, Mr. George Petrie, for saying that " the sepulchral urns of Ireland are superior in ornament to any found in England. The ornaments of gold frequently found in them are richer and more numerous." And he does not hesitate to infer from these and other facts, that "the pagan Irish were superior in the arts of civilized life to their British neighbours."

These urns found at Loughanmore were found to have been all placed with the mouth downwards. They lay rather closely together, scarce eighteen inches apart from each other, the smaller urns appearing to surround the larger one, which was that broken by the horse.

The two smaller sized urns were of the same size, and would hold probably eight or nine quarts of liquid each.

No metallic remains of brass or bronze; no flint arrowheads, stone adzes, or any other remains were found. Every probability exists of future discoveries of a most interesting description being made on a stricter examination of this cairn.

Opportunities such as this daily offer themselves in this country, of pursuing an inquiry of deep historical interest; which if they were to occur at the other side of the Irish channel, would be grasped at with avidity by the untiring zeal of many an English antiquary, who, while he cultivates assiduously, and under circumstances of extreme difficulty, the meagre opportunities which England affords to the study of ancient *British* and Celtic remains, cannot but look with a feeling of astonishment (akin perhaps to contempt), on the apathy with which in Ireland we suffer daily the tangible and unquestionable proofs of the early civilization of our country, to which we have long proudly laid claim, actually to perish before our eyes, from the most disgraceful negligence.

The Chair having been taken, *pro tempore*, by the Rev. J. H. Todd, D. D., V. P., the President communicated the following proof of the known law of Composition of Forces.

Two rectangular forces, x and y, being supposed to be equivalent to a single resultant force p, inclined at an angle v to the force x, it is required to determine the law of the dependence of this angle on the ratio of the two component forces x and y.

Denoting by p' any other single force, intermediate between x and y, and inclined to x at an angle v', which we shall suppose to be greater than v; and denoting by x' and y' the rectangular components of this new force p', in the directions of x and y, we may, by easy decompositions and recompositions, obtain a new pair of rectangular forces, x'' and y'', which are together equivalent to p', and have for components

$$x'' = \frac{x}{p} x' + \frac{y}{p} y';$$

$$y'' = \frac{x}{p} y' - \frac{y}{p} x';$$